

1997 Texas Surface Water Quality Standards

(December 21, 2005)

EPA has not completed its review of all new and revised provisions in the 2000 Texas Surface Water Quality Standards (TX WQS). Therefore, portions of the previously-approved 1997 TX WQS are still effective for Clean Water Act purposes. The summary preceding the 2000 TX WQS identifies which new or revised items have been approved or disapproved by EPA.

The following sections from the 1997 TX WQS contain **at least** one provision which is still effective for Clean Water Act purposes. These sections are listed below:

§307.4 - General Criteria

§307.6 - Toxic Materials

§307.7 - Site-specific Uses and Criteria

§307.8 - Application of Standards

§307.9 - Determination of Standards Attainment

Appendix A - Site-specific Uses and Criteria for Classified Segments

**TEXAS NATURAL RESOURCE CONSERVATION
COMMISSION**

Texas Surface Water Quality Standards

§§307.1-307.10

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CHAPTER 307
TABLE OF CONTENTS

§307.1. General Policy Statement	1
§307.2. Description of Standards.	1
§307.3. Definitions and Abbreviations.	4
§307.4. General Criteria.	11
§307.5. Antidegradation.	13
§307.6. Toxic Materials.	15
TABLE 1	17
TABLE 2	20
TABLE 3	23
§307.7. Site-Specific Uses and Criteria.	30
TABLE 4	33
TABLE 5	35
§307.8. Application of Standards	36
§307.9. Determination of Standards Attainment.	40
§307.10. Appendices A - E.	42
Appendix A - Site-specific Uses and Criteria for Classified Segments	43
Appendix B - Low-Flow Criteria,	73
Appendix C - Segment Descriptions,	83
Appendix D - Site-specific Receiving Water Assessments	113
Appendix E - Site-specific Criteria	125

§307.4. General Criteria.

(a) Application. The general criteria set forth in this section apply to surface water in the state and specifically apply to substances attributed to waste discharges or the activities of man. General criteria do not apply to those instances in which surface water, as a result of natural phenomena, exhibit characteristics beyond the limits established by this section. General criteria are superseded by specific exemptions stated in this section or in §307.8 of this title (relating to the Application of Standards), or by site-specific water quality standards for classified segments. Provisions of the general criteria remain in effect in mixing zones or below critical low-flow conditions unless specifically exempted in §307.8 of this title (relating to the Application of Standards).

(b) Aesthetic parameters.

(1) Concentrations of taste and odor producing substances shall not interfere with the production of potable water by reasonable water treatment methods, impart unpalatable flavor to food fish including shellfish, result in offensive odors arising from the waters, or otherwise interfere with the reasonable use of the water in the state.

(2) Surface water shall be essentially free of floating debris and suspended solids that are conducive to producing adverse responses in aquatic organisms or putrescible sludge deposits or sediment layers which adversely affect benthic biota or any lawful uses.

(3) Surface waters shall be essentially free of settleable solids conducive to changes in flow characteristics of stream channels or the untimely filling of reservoirs, lakes, and bays.

(4) Surface waters shall be maintained in an aesthetically attractive condition.

(5) Waste discharges shall not cause substantial and persistent changes from ambient conditions of turbidity or color.

(6) There shall be no foaming or frothing of a persistent nature.

(7) Surface waters shall be maintained so that oil, grease, or related residue will not produce a visible film of oil or globules of grease on the surface or coat the banks or bottoms of the watercourse; or cause toxicity to man, aquatic life, or terrestrial life in accordance with §307.4(d) of this title (relating to toxic parameters).

(c) Radiological parameters. Radioactive materials shall not be discharged in excess of the amount regulated by Chapter 336 of this title (relating to Radiation Rules).

(d) Toxic parameters. Surface waters will not be toxic to man from ingestion of water, consumption of aquatic organisms, or contact with the skin, or to terrestrial or aquatic life. Additional standards requirements for toxic materials are specified in §307.6 of this title (relating to Toxic Materials).

(e) Nutrient parameters. Nutrients from permitted discharges or other controllable sources shall not cause excessive growth of aquatic vegetation which impairs an existing, attainable, or designated use. Sitespecific nutrient criteria, nutrient permit limitations, and/or separate rules to control nutrients in individual watersheds will be established where appropriate after notice and opportunity for public participation and proper hearing.

(f) Temperature. Consistent with §307.1 of this title (relating to General Policy Statement) and in accordance with state water rights permits, temperature in industrial cooling lake impoundments and all other surface water in the state shall be maintained so as to not interfere with the reasonable use of such waters. Numerical temperature criteria have not been specifically established for industrial cooling lake impoundments, which in most areas of the state contribute to water conservation and water quality objectives. With the exception of industrial cooling impoundments, temperature elevations due to discharges of treated domestic (sanitary) effluent, and designated mixing zones, the following temperature criteria, expressed as a maximum temperature differential (rise over ambient) are established: freshwater streams -5°F; freshwater lakes and impoundments - 3°F; tidal river reaches, bay and gulf waters - 4°F in fall, winter, and spring, and 1.5°F in summer (June, July, and August). Additional temperature criteria (expressed as maximum temperatures) for classified segments are specified in Appendix A of §307.10 of this title (relating to Appendices A - E).

(g) Salinity.

(1) Estuarine salinity criteria have not been established, despite the recognition that proper salinity gradient maintenance is important for the continuation of balanced and desirable populations of estuarine dependent marine life, because weather is the dominant factor influencing salinity gradients.

(2) Absence of numerical salinity criteria shall not preclude evaluations and regulatory actions based on estuarine salinity, and careful consideration will be given to all activities which may detrimentally affect salinity gradients in estuarine waters.

(3) Concentrations and the relative ratios of dissolved minerals such as chlorides, sulfates, and total dissolved solids will be maintained such that attainable uses will not be impaired.

(h) Dissolved oxygen and aquatic life uses.

(1) Dissolved oxygen criteria for unclassified waters with aquatic life uses will be sufficient to support appropriate aquatic life use categories, in accordance with §307.7 of this title (relating to Site-specific Uses and Criteria). Perennial streams, rivers, lakes, bays, estuaries, and other appropriate perennial waters which are not specifically listed in Appendix A or D of §307.10 of this title are presumed to have a high aquatic life use and corresponding dissolved oxygen criteria. In accordance with results from statewide ecoregion studies, unclassified perennial streams in southeast and northeast Texas are assigned dissolved oxygen criteria as indicated in §307.7(b)(3)(A)(ii) of this title. Higher uses will be maintained where they are attainable.

(2) Intermittent streams which are not specifically listed in Appendix A or D of §307.10 of this title will maintain a 24-hour dissolved oxygen mean of 2.0 mg/L and an absolute minimum dissolved oxygen concentration of 1.5 mg/L. For intermittent streams with seasonal aquatic life uses, dissolved oxygen concentrations commensurate with the aquatic life uses will be maintained during the seasons in which the aquatic life uses occur. Unclassified intermittent streams with significant aquatic life uses created by perennial pools are presumed to have a limited aquatic life use and corresponding dissolved oxygen criteria. Additional definitions of significant aquatic life, perennial pools, and seasonal uses will be developed in the standards implementation procedures. Higher uses will be maintained where they are attainable.

(i) Bacteria. A fecal coliform criterion of not more than 200 bacteria per 100 ml shall apply to all waterbodies not specifically listed in Appendix A of §307.10 of this title (relating to Appendices A - E). Application of this criterion shall be in accordance with §307.7(b)(1) of this title.

(j) Antidegradation. Nothing in this section shall be construed or otherwise utilized to supersede the requirements of §307.5 of this title (relating to Antidegradation).

(k) Assessment of unclassified waters. Waters which are not specifically listed in Appendices A or D of §307.10 of this title are designated for the specific uses that are attainable or characteristic of those waters. Upon administrative or regulatory action by the commission which affects a particular unclassified waterbody, the characteristics of the affected waterbody will be reviewed to determine which aquatic life uses are appropriate. Additional uses so determined shall be indicated in public notices for discharge applications. Uses which are not applicable throughout the year in a particular unclassified waterbody will be assigned and protected for the seasons in which such uses are attainable. Initial determinations of use shall be considered preliminary, and in no way preclude redeterminations of use in public hearings conducted by the commission under the provisions of the Texas Water Code. For unclassified waters where the presumed minimum uses or criteria specified in this section are inappropriate, site-specific standards may be developed in accordance with §307.2(d) of this title (relating to Modification of Standards). Uses and criteria will be assigned in accordance with this section and with §307.7(3) of this title. Procedures for assigning uses and criteria are described in the standards implementation procedures.

Adopted March 19, 1997

Effective April 30, 1997

§307.5. Antidegradation.

(a) Application. The antidegradation policy and implementation procedures set forth in this section shall apply to actions regulated under state and federal authority which would increase pollutant loads to the water in the state. Such actions include authorized wastewater discharges, waste load evaluations, and any other miscellaneous actions, such as those related to man-induced nonpoint sources of pollution, which may impact the water in the state.

(b) Antidegradation policy. In accordance with the Texas Water Code, §26.003, it is the policy of the commission that:

dissolved oxygen, analyses of degradation will utilize the same critical conditions as are used for permit reviews and waste load evaluations. For other parameters, appropriate conditions may vary. Conditions for determining degradation will be commensurate with conditions for determining existing uses. The highest water quality sustained since November 28, 1975 (in accordance with EPA Standards Regulation 40 Code of Federal Regulations Part 131) define baseline conditions for determinations of degradation.

(4) When degradation of waters exceeding fishable/swimmable quality is anticipated, a statement that the antidegradation policy will be pertinent to the permit action will be included in the public notice for the said permit application or amendment. If no degradation is anticipated, the public notice will so state. The determination of existing use and the probability of degradation are issues upon which evidence can be introduced in permit hearings.

(5) Interested parties will be given the opportunity to provide comments and additional information concerning the determination of existing uses, anticipated impacts of the discharge, baseline conditions, and necessity of the discharge for important economic or social development if degradation of water quality is expected. The commissioners will decide after full satisfaction of the intergovernmental coordination and public participation provisions of the continuing planning process if the economic or social development is important enough to allow the degradation.

(6) Waste load evaluations conducted by the commission will adhere to the provisions of the antidegradation policy. If the waste load evaluation indicates that degradation of waters exceeding fishable/swimmable quality is expected, the public hearing notice will so state. The commission will not approve any waste load evaluation that would allow degradation of waters exceeding fishable/swimmable quality unless and until it has been demonstrated to the commission that the recommended lower water quality is necessary for important economic or social development. Permits which are consistent with an approved waste load evaluation under this antidegradation policy will not be separately subjected to the antidegradation provisions of this section unless the discharge may cause impacts on the receiving water which were not addressed by the waste load evaluation.

(7) Additional implementation procedures for the antidegradation policy are described in the standards implementation procedures.

Adopted June 14, 1995

Effective July 13, 1995

§307.6. Toxic Materials.

(a) Application. Standards and procedures set forth in this section shall be applied in accordance with §307.8 of this title (relating to Application of Standards) and §307.9 of this title (relating to Determination of Standards Attainment).

(b) General provisions.

(1) Water in the state shall not be acutely toxic to aquatic life in accordance with §307.8 of this title (relating to Application of Standards).

(2) Water in the state with designated or existing aquatic life uses shall not be chronically toxic to aquatic life, in accordance with §307.8 of this title (relating to Application of Standards).

(3) Water in the state shall be maintained to preclude adverse toxic effects on human health resulting from contact recreation, consumption of aquatic organisms, consumption of drinking water or any combination of the above. Waters in the state with sustainable fisheries and/or public drinking water supply uses will not exceed applicable human health toxic criteria, in accordance with §307.6(d) of this title (relating to specific human health criteria) and §307.8 of this title (relating to Application of Standards).

(4) Water in the state shall be maintained to preclude adverse toxic effects on aquatic and terrestrial wildlife, livestock, or domestic animals, resulting from contact, consumption of aquatic organisms, consumption of water, or any combination of the above.

(c) Specific numerical aquatic life criteria.

(1) Numerical criteria are established in Table 1 for those specific toxic substances for which adequate toxicity information is available, and which have the potential for exerting adverse impacts on water in the state.

(2) Numerical criteria are based on ambient water quality criteria documents published by EPA. EPA guidance criteria have been appropriately recalculated to eliminate the effects of toxicity data for aquatic organisms which are not native to Texas, in accordance with procedures in the EPA guidance document entitled *Guidelines for Deriving Numerical Site-specific Water Quality Criteria* (EPA 600/3-84-099).

(3) Specific numerical acute aquatic life criteria are applied as 24-hour averages, and specific numerical chronic aquatic life criteria are applied as seven-day averages.

(4) Ammonia and chlorine toxicity will be addressed by total toxicity biomonitoring requirements in subsection (e) of this section.

(5) Specific numerical aquatic life criteria for metals and metalloids in Table 1 apply to dissolved concentrations (unless otherwise stated), which can be estimated by filtration of samples prior to analysis, or by converting from total recoverable measurements in accordance with procedures approved by the commission in the latest revision of the standards implementation procedures. Specific numerical aquatic life criteria for non-metallic substances in Table 1 apply to total recoverable concentrations unless otherwise noted.

TABLE 1
Criteria in Water for Specific Toxic Materials -
AQUATIC LIFE PROTECTION
(All values are listed or calculated in micrograms per liter)
(Hardness concentrations are input as milligrams per liter)

Parameter	Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria
Aldrin	3.0	---	1.3	---
Aluminum (d)	991	---	---	---
Arsenic (d)	360	190	149	78
Cadmium (d)	$(1.128(\ln(\text{hardness}))-1.6774)$ e	$(0.7852(\ln(\text{hardness}))-3.490)$ e	45.62	10.02
Carbaryl	2.0	---	613	---
Chlordane	2.4	0.0043	0.09	0.004
Chlorpyrifos	0.083	0.041	0.011	0.0056
Chromium (Tri) (d)	$(0.8190(\ln(\text{hardness}))+3.688)$ e	$(0.8190(\ln(\text{hardness}))+1.561)$ e	---	---
Chromium (Hex) (d)	16	11	1,100	50
Copper (d)*	$(0.9422(\ln(\text{hardness}))-1.3844)$ e	$(0.8545(\ln(\text{hardness}))-1.386)$ e	16.27	4.37
Cyanide † (free)	45.78	10.69	5.6	5.6
4,4'- DDT	1.1	0.0010	0.13	0.0010
Demeton	---	0.1	---	0.1
Dicofol	59.3	19.8	---	---
Dieldrin	2.5	0.0019	0.71	0.0019
Diuron	210	70	---	---
Endosulfan I (alpha)	0.22	0.056	0.034	0.0087
Endosulfan II (beta)	0.22	0.056	0.034	0.0087
Endosulfan sulfate	0.22	0.056	0.034	0.0087

TABLE 1 (continued)

Parameter	Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria
Endrin	0.18	0.0023	0.037	0.0023
Guthion	---	0.01	---	0.01
Heptachlor	0.52	0.0038	0.053	0.0036
Hexachlorocyclohexane (Lindane)	2.0	0.08	0.16	---
Lead (d)	$e^{(1.273(\ln(\text{hardness}))-1.460)}$	$e^{(1.273(\ln(\text{hardness}))-4.705)}$	140	5.6
Malathion	---	0.01	---	0.01
Mercury	2.4	1.3	2.1	1.1
Methoxychlor	---	0.03	---	0.03
Mirex	---	0.001	---	0.001
Nickel (d)	$e^{(0.8460(\ln(\text{hardness}))+3.3612)}$	$e^{(0.8460(\ln(\text{hardness}))+1.1645)}$	119	13.2
Polychlorinated Biphenyls (PCBs)*†	2.0	0.014	10	0.03
Parathion (ethyl)	0.065	0.013	---	---
Phenanthrene	30	30	7.7	4.6
Pentachlorophenol	$e^{(1.005(\text{pH})-4.830)}$	$e^{(1.005(\text{pH})-5.290)}$	15.14	9.56
Selenium	20	5	564	136
Silver, as free ion	0.92	---	2.3	---
Toxaphene	0.78	0.0002	0.21	0.0002
Tributyltin (TBT)	0.13	0.024	0.24	0.043
2,4,5 Trichlorophenol	136	64	259	12
Zinc (d)	$e^{(0.8473(\ln(\text{hardness}))+0.8604)}$	$e^{(0.8473(\ln(\text{hardness}))+0.7614)}$	98	89

* In designated oyster waters an acute marine copper criterion of 4.37 micrograms per liter applies outside of the mixing zone of permitted discharges, and specified mixing zones for copper will not encompass oyster reefs containing live oysters.

† Compliance will be determined using the analytical method for cyanide amenable to chlorination or by weak acid dissociable cyanide.

‡ Calculated as the sum of seven PCB congeners 1242, 1254, 1221, 1232, 1248, 1260 and 1016.

(d) Indicates that the criteria for a specific parameter are for the dissolved portion in water. All other criteria are for total recoverable concentrations, except where noted.

(6) Specific numerical acute criteria for toxic substances are applicable to all waters in the state except for small zones of initial dilution (ZIDs) at discharge points. Acute criteria may be exceeded within a ZID, but there shall be no lethality to aquatic organisms which move through a ZID, and the sizes of ZIDs are limited in accordance with §307.8 of this title. Specific numerical chronic criteria are applicable to all waters in the state with designated or existing aquatic life uses, except inside mixing zones and below critical low-flow conditions, in accordance with §307.8 of this title.

(7) For toxic materials for which specific numerical criteria are not listed in Table 1, the appropriate criteria for aquatic life protection may be derived in accordance with current EPA guidelines for deriving site-specific water quality criteria. When insufficient data are available to use EPA guidelines, the following provisions shall be applied in accordance with this section and §307.8 of this title:

(A) acute criteria will be calculated as 0.3 of the LC_{50} of the most sensitive aquatic organism; $LC_{50} \times (0.3) = \text{acute criteria}$;

(B) concentrations of non-persistent toxic materials shall not exceed concentrations which are chronically toxic (as determined from appropriate chronic toxicity data or calculated as 0.1 of acute LC_{50} values) to the most sensitive aquatic organisms; $LC_{50} \times (0.1) = \text{chronic criteria}$;

(C) concentrations of persistent toxic materials that do not bioaccumulate shall not exceed concentrations which are chronically toxic (as determined from appropriate chronic toxicity data or calculated as 0.05 of LC_{50} values) to the most sensitive aquatic organisms; and

(D) concentrations of toxic materials that bioaccumulate shall not exceed concentrations that are chronically toxic (as determined from appropriate chronic toxicity data or calculated as 0.01 of LC_{50} values) to the most sensitive aquatic organisms.

(8) For toxic substances where the relationship of toxicity is defined as a function of pH or hardness, numerical criteria are presented as an equation based on this relationship. Appropriate pH or hardness values for such criteria are listed for each basin in Table 2. The indicated pH and hardness values (Table 2) for each basin will be assumed unless sufficient data are available to derive segment specific pH and hardness values.

TABLE 2

Total Hardness and pH Values (15th percentile) Used for Determining Select In-stream Toxic Criteria. Segment values will be used when there is sufficient data.

Alternative percentile values may be used to determine permit limits which are protective during low-flow conditions. A list of these values can be found in the standards implementation procedures. All values are from long-term Statewide Monitoring Network Data.

Basin Number/ Name	pH	Hardness
(01) Canadian River Basin	7.7	200
(02) Red River Basin	7.4	169
(03) Sulphur River Basin	6.8	54
(04) Cypress Creek Basin	6.0	23
(05) Sabine River Basin	6.5	30
(06) Neches River Basin	6.5	32
(07) Neches-Trinity Coastal Basin	6.7	84
(08) Trinity River Basin	7.2	80
(09) Trinity-San Jacinto Coastal Basin	7.1	115
(10) San Jacinto River Basin	6.7	54
(11) San Jacinto-Brazos Coastal Basin	7.2	150
(12) Brazos River Basin	7.4	141
(13) Brazos-Colorado Coastal Basin	7.3	96
(14) Colorado River Basin	7.5	170
(15) Colorado-Lavaca Coastal Basin	7.5	111
(16) Lavaca River Basin	7.4	90
(17) Lavaca-Guadalupe Coastal Basin	7.5	140*
(18) Guadalupe River Basin	7.6	190
(19) San Antonio River Basin	7.4	230
(20) San Antonio-Nueces Coastal Basin	7.2	110
(21) Nueces River Basin	7.6	160
(22) Nueces-Rio Grande Coastal Basin	7.4	400
(23) Rio Grande Basin	7.7	250
(24) Bays and Estuaries	7.7	n/a

* insufficient data--average values of adjacent basins are assumed.

(9) Numerical criteria for bioconcentratable pollutants will be derived in accordance with the general procedures in the EPA guidance document entitled, *Assessment and Control of Bioconcentratable Contaminants in Surface Waters* (March 1991). The commission may develop discharge permit limits in accordance with the provisions of this section.

(10) Numerical human health criteria are expressed as total recoverable concentrations for nonmetals, and for mercury, and as dissolved concentrations for other metals and metalloids.

(11) Additional site-specific factors may indicate that the numerical human health criteria listed in Table 3 are inappropriate for a particular waterbody. These factors are applied as a site-specific standards modification in accordance with §307.2(d) of this title (relating to Modification of Standards). The application of site-specific criteria shall not impair an existing, attainable, or designated use or affect human health. Factors which may justify a temporary variance or site-specific standards amendment include the following:

(A) background concentrations of specific toxics of concern in receiving waters, sediment, and/or indigenous biota;

(B) persistence and degradation rate of specific toxic materials;

(C) synergistic or antagonistic interactions of toxic substances with other toxic or nontoxic materials;

(D) technological or economic limits of treatability for specific toxic materials;

(E) bioavailability of specific toxic substances of concern;

(F) local water chemistry and other site-specific conditions which may alter the bioconcentration, bioaccumulation, or toxicity of specific toxic substances;

(G) site-specific differences in the bioaccumulation responses of indigenous, edible aquatic organisms to specific toxic materials;

(H) local differences in consumption patterns of fish and shellfish or drinking water, but only if any changes in assumed consumption rates will be protective of the local population that frequently consumes fish, shellfish, or drinking water from a particular waterbody and;

(I) new information concerning the toxicity of a particular substance.

(e) Total toxicity.

(1) Total (whole-effluent) toxicity of permitted discharges, as determined from biomonitoring of effluent samples at appropriate dilutions, will be sufficiently controlled to preclude acute total toxicity in all water in the state with the exception of small zones of initial dilution at discharge points (ZIDs). Acute total toxicity levels may be exceeded in a ZID, but there shall be no lethality to aquatic organisms which move through a ZID, and the sizes of ZIDs are limited in

accordance with §307.8 of this title (relating to Application of Standards). Chronic total toxicity, as determined from biomonitoring of effluent samples, will be precluded in all water in the state with existing or designated aquatic life uses except in mixing zones and at flows less than critical low-flows, in accordance with §307.8 of this title (relating to Application of Standards).

(2) General provisions for controlling total toxicity.

(A) Dischargers whose effluent has a significant potential for exerting toxicity in receiving waters will be required to conduct whole effluent toxicity biomonitoring at appropriate dilutions.

(B) In addition to the other requirements of this section, the effluent of discharges to waters in the state shall not be acutely toxic to sensitive species of aquatic life, as demonstrated by effluent toxicity tests. Toxicity testing for this purpose shall be conducted on samples of 100% effluent, and the criterion for acute toxicity shall be mortality of 50% or more of the test organisms after 24 hours of exposure. These observations for acute toxicity may be conducted during either acute or chronic toxicity tests, which are described in the standards implementation procedures. This provision does not apply to mortality that is a result of an excess, deficiency, or imbalance of dissolved inorganic salts (such as sodium, calcium, potassium, chloride, carbonate) which are in the effluent and are not listed in Table 1 in §307.6(c) of this title or which are in source waters.

(C) The latest revisions of the following EPA publications provide methods for appropriate biomonitoring procedures: *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, and the *Technical Support Document for Water Quality-based Toxics Control*. The use of other procedures approved by the commission is also acceptable. Toxicity tests must be conducted using representative, sensitive aquatic organisms as approved by the commission, and any such testing must adequately determine if toxicity standards are being attained.

(D) If toxicity biomonitoring results indicate that a discharge is exceeding the restrictions on total toxicity in this section, then the permittee shall conduct a toxicity identification evaluation and toxicity reduction evaluation in accordance with permitting procedures of the commission. As a result of a toxicity reduction evaluation, additional conditions may be established in the permit. Such conditions may include total toxicity limits, chemical specific limits, and/or best management practices designed to reduce or eliminate toxicity. Where sufficient to attain and maintain applicable numeric and narrative state water quality standards, a chemical specific limit rather than a total toxicity limit may be established in the permit. Where conditions may be necessary to prevent or reduce effluent toxicity, permits shall include a reasonable schedule for achieving compliance with such additional conditions.

(E) If a permittee demonstrates, using the toxicity identification evaluation and toxicity reduction evaluation procedures, that diazinon is the primary cause of total toxicity, and that diazinon is ubiquitous within the wastewater system, the toxicity will be addressed in §307.6(e)(2)(E)(i) and (ii) of this title. If diazinon is not the primary cause of total toxicity, or if the permittee

does not proceed with due diligence in controlling and investigating toxicity, or if diazinon is not ubiquitous within the wastewater system, the toxicity may be addressed in accordance with §307.6(e)(2)(D) of this title.

(i) the permittee will be required to implement a public education and awareness campaign designed to control the introduction of diazinon into the wastewater system, and the permittee will be required to conduct an investigation into the sources of diazinon; and

(ii) the permittee will be required to monitor for diazinon.

(F) Discharge permit limits based on total toxicity may be established in consideration of site-specific factors, but the application of such factors shall not result in impairment of an existing, attainable, or designated use. These factors are applied as a site-specific standards modification in accordance with §307.2(d) of this title. A demonstration that uses are protected may consist of additional effluent toxicity testing, instream monitoring requirements, and/or other necessary information as determined by the commission. Factors which may justify a temporary variance or site-specific standards amendment include the following:

(i) background toxicity of receiving waters;

(ii) persistence and degradation rate of principal toxic materials which are contributing to the total toxicity of the discharge;

(iii) site-specific variables which may alter the impact of toxicity in the discharge; and

(iv) indigenous aquatic organisms, which may have different levels of sensitivity than the species used for total toxicity testing; and

(v) technological, economic, or legal limits of treatability or control for specific toxic materials.

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§307.7. Site-Specific Uses and Criteria.

(a) Uses and numerical criteria are established on a site-specific basis for classified segments in Appendix A of §307.10 of this title (relating to Appendices A - E). Site-specific uses and numerical criteria may also be applied to unclassified waters in accordance with §307.4(h) of this title (relating to General Criteria) and §307.5(c) of this title (relating to Antidegradation). Site-specific criteria apply specifically to substances attributed to waste discharges or the activities of man. Site-specific criteria do not apply to those instances in which surface waters exceed criteria limits due to natural phenomena. The application of site-specific uses and criteria is described in §307.8 of this title (relating to the Application of Standards) and §307.9 of this title (relating to the Determination of Standards Attainment).

(ii) Aquifer protection. Segments designated for aquifer protection are capable of recharging the Edwards Aquifer. The principal purpose of this use designation is to protect the quality of water infiltrating into and recharging the aquifer.

(B) Use criteria. The following use criteria apply to both domestic water supply use subcategories.

(i) Radioactivity associated with dissolved minerals in the freshwater portions of river basin and coastal basin waters should not exceed levels established by drinking water standards as specified in Chapter 290 of this title unless the conditions are of natural origin.

(ii) Surface waters utilized for domestic water supply shall not exceed toxic material concentrations that prevent them from being treated by conventional surface water treatment to meet drinking water standards as specified in Chapter 290 of this title.

(iii) Chemical and microbiological quality of surface waters used for domestic water supply should conform to drinking water standards as specified in Chapter 290 of this title.

(3) Aquatic life. The establishment of numerical criteria for aquatic life is highly dependent on desired use, sensitivities of usual aquatic communities, and local physical and chemical characteristics. Five subcategories of aquatic life use are established. They include limited, intermediate, high, and exceptional aquatic life and oyster waters. Aquatic life use subcategories designated for segments listed in Appendix A of §307.10 of this title recognize the natural variability of aquatic community requirements and local environmental conditions.

(A) Dissolved oxygen.

(i) The definitions and associated dissolved oxygen criteria for limited, intermediate, high, and exceptional aquatic life use subcategories are indicated in Table 4.

(ii) The dissolved oxygen criteria and associated critical low-flow values in Table 5 apply to unclassified streams which have significant aquatic life uses, and to streams which are specifically listed in Appendix D of §307.10 of this title. The criteria in Table 5 apply to all parts of Texas which are east of a line defined by Interstate Highway 35 and 35W from the Red River to the community of Moore in Frio County, and by U.S. Highway 57 from the community of Moore to the Rio Grande. The critical low-flow values in Table 5 (at the appropriate stream bedslope) will be utilized as headwater flows to determine discharge effluent limits necessary to achieve dissolved oxygen criteria. The required effluent limits will be those necessary to achieve each level of dissolved oxygen (as defined in §307.7(b)(3)(A)(i), Table 4) at or below an assigned or presumed aquatic life use. Presumed aquatic life uses will be in accordance with those required by §307.4(h) of this title. The dissolved oxygen criteria in Table 5 do not apply to tidal streams or streams which are specifically listed in Appendix A of §307.10 of this title.

(iii) The dissolved oxygen criteria in Table 5 are based upon data from the commission's least impacted stream study (Texas Aquatic Ecoregion Project). Results of this study indicate a strong dependent relationship for average summertime background dissolved oxygen concentrations and several hydrologic and physical stream characteristics - particularly bedslope (stream gradient) and stream flow. The dissolved oxygen criteria in Table 5 are derived from a multiple regression equation for the eastern portion of Texas as defined in §307.7(b)(3)(A)(ii) of this title. Further explanation of the development of the regression equation and its application will be contained in the standards implementation procedures.

(B) Oyster waters.

(i) A 1,000 foot buffer zone, measured from the shoreline at ordinary high tide, is established for all bay and gulf waters, except those contained in river or coastal basins as defined in §307.2 of this title (relating to Description of Standards). Fecal coliform content in buffer zones shall not exceed 200 colonies per 100 ml as a geometric mean of not less than five samples collected over not more than 30 days or equal or exceed 400 colonies per 100 ml in more than 10% of all samples taken during a 30-day period.

(ii) Median fecal coliform concentration in bay and gulf waters, exclusive of buffer zones, shall not exceed 14 colonies per 100 ml, with not more than 10% of all samples exceeding 43 colonies per 100 ml.

(iii) Oyster waters should be maintained so that concentrations of toxic materials do not cause edible species of clams, oysters, and mussels to exceed accepted guidelines for the protection of public health. Guidelines are provided by U.S. Food and Drug Administration Action Levels for molluscan shellfish.

(4) Additional criteria.

(A) Chemical parameters. Site-specific criteria for chloride, sulfate, and total dissolved solids are established as averages over an annual period for either a single sampling point or multiple sampling points.

(B) pH. Site-specific numerical criteria for pH are established as absolute minima and maxima.

(C) Temperature. Site-specific temperature criteria are established as absolute minima and maxima.

(D) Toxic materials. Criteria for toxic materials are established in §307.6 of this title (relating to Toxic Materials).

(5) Additional uses. Other basic uses, such as navigation, agricultural water supply, and industrial water will be maintained and protected for all water in the state in which these uses can be achieved.

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§307.8. Application of Standards.

(a) Low-flow conditions.

(1) The following standards do not apply below seven-day, two-year low-flows:

(A) site-specific criteria, as defined in §307.7 of this title (relating to Site-specific Criteria and Uses) and listed for each classified segment in Appendix A of §307.10 of this title (relating to Appendices A - E);

(B) numerical chronic criteria for toxic materials as established in §307.6 of this title (relating to Toxic Materials);

(C) total chronic toxicity restrictions as established in §307.6 of this title (relating to Toxic Materials); and

(D) maximum temperature differentials as established in §307.4(f) of this title (relating to General Criteria).

(E) dissolved oxygen criteria for unclassified waters, as established in §307.4(h)(1) of this title (relating to General Criteria).

(F) dissolved oxygen criteria for intermittent streams, as established in §307.4(h)(2) of this title (relating to General Criteria).

(G) fecal coliform criteria for unclassified waters, as established in §307.4(i) of this title (relating to General Criteria).

(2) Numerical acute criteria for toxic materials and preclusion of total acute toxicity as established in §307.6 of this title (relating to Toxic Materials) are applicable at all flow conditions.

(3) Low-flow criteria in Appendix B of §307.10 of this title are solely for the purpose of defining the flow conditions under which water quality standards apply to a given waterbody. Low-flow criteria listed in Appendix B of §307.10 of this title are not for the purpose of regulating flows in waterbodies in any manner or requiring that minimum flows be maintained in classified segments.

(4) Low-flow criteria defined in this section and listed in Appendix B of §307.10 of this title apply only to river basin and coastal basin waters. They do not apply to bay or gulf waters or reservoirs or estuaries.

(5) Seven-day, two-year low-flows (7Q2) and harmonic mean flows in Appendix B of §307.10 of this title were calculated from historical U.S. Geological Survey (USGS) daily streamflow records. The low-flow criterion was set at 0.1 of one cubic foot per second (ft³/s) when the calculated 7Q2 was equal to or less than 0.1 of one ft³/s.

(6) Flow values will be periodically recomputed to reflect alterations in the hydrologic characteristics of a segment, including reservoir construction, climatological trends, and other phenomena.

(7) The general criteria are applicable at all flow conditions except as specified in this section or in §307.4 of this title (relating to General Criteria).

(8) Specific human health criteria for concentrations in water to prevent contamination of fish and shellfish so as to ensure safety for human consumption, as established in §307.6 of this title (relating to Toxic Materials) do not apply at stream flows below the harmonic mean flow.

(b) Mixing zones. A reasonable mixing zone will be allowed at the discharge point of permitted discharges into surface water in the state, in accordance with the following provisions.

(1) The following portions of the standards do not apply within mixing zones:

(A) site-specific criteria, as defined in §307.7 of this title and listed for each classified segment in Appendix A of §307.10 of this title;

(B) numerical chronic aquatic life criteria for toxic materials as established in §307.6 of this title (relating to Toxic Materials);

(C) total chronic toxicity restrictions as established in §307.6 of this title (relating to Toxic Materials);

(D) maximum temperature differentials as established in §307.4(f) of this title (relating to General Criteria);

(E) dissolved oxygen criteria for unclassified waters, as established in §307.4(h)(1) of this title (relating to General Criteria);

(F) dissolved oxygen criteria for intermittent streams, as established in §307.4(h)(2) of this title (relating to General Criteria);

(G) fecal coliform criteria for unclassified waters, as established in §307.4(i) of this title (relating to General Criteria); and

(H) specific human health criteria for concentrations in water to prevent contamination of drinking water, fish and shellfish so as to ensure safety for human consumption, as established in §307.6 of this title (relating to Toxic Materials).

(2) Numerical acute aquatic life criteria for toxic materials and preclusion of total acute toxicity as established in §307.6 of this title (relating to Toxic Materials) are applicable in mixing zones. Acute criteria and acute total toxicity levels may be exceeded in small zones of initial dilution (ZIDs) at discharge points, but there shall be no lethality to aquatic organisms which move through a ZID. ZIDs shall not exceed the following sizes:

(A) 60 feet downstream and 20 feet upstream from a discharge point in a stream and river, and in addition, ZIDs in streams and rivers shall not encompass more than 25% of the volume of stream flow at or above seven-day, two-year low-flow conditions;

(B) a 25-foot radius in all directions (or equivalent volume or area for diffuser systems) from a discharge point in a lake or reservoir; and

(C) a 50-foot radius in all directions (or equivalent volume or area for diffuser systems) from a discharge point in a bay, tidal river, or estuary.

(3) Provisions of the general criteria in §307.4 of this title (relating to General Criteria) remain in effect in mixing zones unless specifically exempted in this section.

(4) Water quality standards do not apply to treated effluents at the immediate point of discharge--prior to any contact with either ambient waters or a dry streambed. However, effluent total toxicity requirements may be specified to preclude acute lethality near discharge points, or to preclude acute and chronic instream toxicity.

(5) Where a mixing zone is defined in a valid commission and/or National Pollutant Discharge Elimination System (NPDES) permit, the mixing zone defined in the permit will apply.

(6) Mixing zones shall not preclude passage of free-swimming or drifting aquatic organisms to the extent that aquatic life use is significantly affected, in accordance with guidelines specified in the standards implementation procedures.

(7) Mixing zones will not overlap unless it can be demonstrated that no applicable standards will be violated in the area of overlap. Existing and designated uses will not be impaired by the combined impact of a series of contiguous mixing zones.

(8) Mixing zones will not encompass an intake for a domestic drinking water supply. Thermal mixing zones are excepted from this provision unless elevated temperatures adversely affect drinking water treatment.

(9) Mixing zones will be individually specified for all permitted domestic discharges with a permitted monthly average flow equal to or exceeding one million gallons per day and for all permitted industrial discharges to water in the state (excepting discharges which consist entirely of stormwater runoff). For domestic discharges with permitted monthly average flows less than one million gallons per day, a small mixing zone will be assumed in accordance with guidelines for mixing zone sizes specified in the standards implementation procedures document; and the commission may require specified mixing zones as appropriate.

(10) The size of mixing zones for human health criteria may vary from the size of mixing zones for aquatic life criteria.

(c) Minimum analytical levels. The specified definition of permit compliance for a specific toxic material will not be lower than established minimum analytical levels, unless that toxic material is of particular concern in the receiving waters, or unless an effluent specific method detection limit has been developed in accordance with 40 CFR Part 136. Minimum analytical levels are listed in the standards implementation procedures.

(d) Once-through cooling water discharges. When a discharge of once-through cooling water does not measurably alter intake concentrations of a pollutant, then water-quality based effluent limits for that pollutant are not required. For facilities which intake and discharge cooling-water into

different waterbodies, this provision only applies if water quality and applicable water quality standards in the receiving water are maintained and protected.

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§307.9. Determination of Standards Attainment.

(a) Sampling locations.

(1) Representative samples to determine standards attainment will be collected at locations approved by the commission. To ensure comparability with past sampling data, samples will be collected at established monitoring stations. Monitoring stations may be established or discontinued by the commission.

(2) Field investigation samples may be collected at points not established or approved as standards attainment sampling locations at the discretion of the commission.

(b) Collection and preservation of water samples.

(1) To ensure that representative samples are collected and to minimize alterations prior to analysis, collection and preservation of attainment determination samples will be in accordance with procedures set forth in the most recently published edition of the book entitled *Standard Methods for the Examination of Water and Waste-water*, the most recent version of the quality assurance program plan for the commission, or other reliable procedures acceptable to the commission.

(2) Bacterial and temperature determinations will be conducted on samples or measurements taken within one foot of the surface. Depth collection procedures for chloride, sulfate, total dissolved solids, dissolved oxygen, and pH to determine standards attainment may vary depending on the waterbody being sampled. Where standards apply to the mixed surface layer, the depth of this layer is determined in accordance with procedures in the latest published edition of the *Texas Surface Water Quality Inventory*. Standards for chloride, sulfate, total dissolved solids, and pH are applicable to the mixed surface layer, but a single sample taken near the surface (at a depth of approximately one foot) normally provides an adequate representation of these parameters. For dissolved oxygen, the following procedures are generally applicable:

(A) Non-tidal flowing streams. In flowing streams, a profile should be obtained to determine if the water column is uniformly mixed. Samples shall be collected one foot below the water surface in streams exhibiting a vertically mixed water column. A depth-integrated sample shall be used to determine attainment in unmixed streams. Where depth is less than 1.5 feet, the collection depth shall be one-third of the water depth measured from the water surface.

(B) Impoundments. Representative samples shall be collected from the entire water column in the absence of thermal stratification. Collection of representative samples shall be confined to the epilimnion when an impoundment is thermally stratified.

(C) Bays. A depth-integrated (vertical composite) sample shall be collected from the surface to the natural bottom. Dredged areas shall not be considered part of the natural bottom.

(D) Tidal streams. A surface to bottom profile of DO, pH, conductivity, and temperature shall be obtained in all cases. Under conditions of density stratification, a composite sample collected from the mixed surface layer shall be used to determine standards attainment.

(3) Numerical aquatic life criteria for toxic materials are applicable to water samples collected at any depth. Numerical human health criteria are applicable to the average concentration from the surface to the bottom.

(c) Sample analysis.

(1) Numerical values. Numerical values in the water quality standards shall be determined by analytical procedures recommended in the most recently published edition of the book entitled *Standard Methods for the Examination of Water and Wastewater*, the quality assurance program plan for the commission, Title 40 Chapter 136 of the Code of Federal Regulations, or other reliable methods acceptable to the commission.

(2) Radioactivity. Measurements will be made on filtered samples to determine radioactivity associated with dissolved minerals.

(3) Toxicity. Bioassay techniques will be selected as testing situations dictate but will generally be conducted using representative sensitive organisms in accordance with §307.6 of this title (relating to Toxic Materials).

(4) Bacteria. Bacteriological levels shall be determined by either multiple-tube fermentation or membrane filter techniques.

(d) Sampling periodicity and evaluation.

(1) Chloride, sulfate, total dissolved solids (TDS). Standards attainment determinations shall be based on the average of measurements taken on at least four different dates within one year. Results from all monitoring stations within the segment will be averaged to allow for reasonable parametric gradients. TDS determinations may be based on measurements of specific conductance. Conversion factors are presented in the latest publication of the *Texas Surface Water Quality Inventory* or may be based on additional site-specific data.

(2) Radioactivity. The impact of radioactive discharges on the surface waters in Texas will be evaluated utilizing information developed by the Sanitary Engineering Research Laboratory at the University of Texas and presented in the June 30, 1960, report entitled, *Report on Radioactivity - Levels in Surface Waters - 1958-1960*.

(3) Bacteria. Standards attainment for fecal coliform bacteria will be determined as described in §307.7(b)(1) of this title (relating to Site-specific Uses and Criteria).

(4) Toxic materials. Specific numerical acute toxic criteria are applied as 24-hour averages, and specific numerical chronic toxic criteria are applied as seven-day averages. Human health criteria are applied as long term average exposure criteria designed to protect populations over a life time of 70 years. Standards attainment for human health criteria will be based on the average of a minimum of four samples collected over at least a one year period.

(5) Temperature and pH. Standards attainment will be evaluated for measurements or samples taken at a single point in time.

(6) Dissolved oxygen.

(A) Criteria for daily (24-hour) average concentrations will be compared to a time-weighted average of measurements taken over a 24-hour period.

(B) Criteria for minimum concentrations will be compared to individual measurements taken at night (from sunset until two hours after sunrise).

§307.10. Appendices A - E.

The following appendices are integral components of this chapter of the Texas Surface Water Quality Standards:

- (1) Appendix A - Site-specific Uses and Criteria for Classified Segments.
- (2) Appendix B - Low Flow Criteria.
- (3) Appendix C - Segment Descriptions.
- (4) Appendix D - Site-specific Receiving Water Assessments.
- (5) Appendix E - Site-specific Criteria.

NECHES RIVER BASIN		USES				CRITERIA						
		Recreation	Aquatic Life	Domestic Water Supply	Other	Cl ⁻¹ (mg/L)	SO ₄ ⁻² (mg/L)	TDS (mg/L)	Dissolved Oxygen (mg/L)	pH Range (SU)	Fecal Coliform #/100ml	Temperature (pF)
Segment No.	SEGMENT NAME											
0601	Neches River Tidal	CR	I						3.0	6.0-8.5	200	95
0602	Neches River Below B. A. Steinhagen Lake	CR	H	PS		50	30	150	5.0	6.0-8.5	200	91
0603	B. A. Steinhagen Lake	CR	H	PS		50	30	150	5.0	6.0-8.5	200	93
0604	Neches River Below Lake Palestine	CR	H	PS		50	30	150	5.0	6.0-8.5	200	91
0605	Lake Palestine	CR	H	PS		50	30	150	5.0	6.0-8.5	200	90
0606	Neches River Above Lake Palestine	CR	I	PS		50	30	150	4.0	6.0-8.5	200	95
0607	Pine Island Bayou	CR	H	PS		150	50	300	5.0	6.0-8.5	200	95
0608	Village Creek	CR	H	PS		150	75	300	5.0	6.0-8.5	200	90
0609	Angelina River Below Sam Rayburn Reservoir	CR	H	PS		70	40	250	5.0	6.0-8.5	200	90
0610	Sam Rayburn Reservoir	CR	H	PS		70	40	250	5.0	6.0-8.5	200	93
0611	Angelina River Above Sam Rayburn Reservoir	CR	H	PS		125	40	250	5.0	6.0-8.5	200	90
0612	Attoyac Bayou	CR	H	PS		75	50	150	5.0	6.0-8.5	200	90
0613	Lake Tyler/Lake Tyler East	CR	H	PS		30	30	150	5.0	6.5-9.0	200	93
0614	Lake Jacksonville	CR	H	PS		50	75	750	5.0	6.5-9.0	200	93

GUADALUPE RIVER BASIN		USES				CRITERIA						
		Recreation	Aquatic Life	Domestic Water Supply	Other	Cl ⁻¹ (mg/L)	SO ₄ ⁻² (mg/L)	TDS (mg/L)	Dissolved Oxygen (mg/L)	pH Range (SU)	Fecal Coliform #/100ml	Temperature (bF)
Segment No.	SEGMENT NAME											
1801	Guadalupe River Tidal	CR	E						5.0	6.5-9.0	200	95
1803	Guadalupe River Below San Marcos River	CR	H	PS		100	50	400	5.0	6.5-9.0	200	93
1804	Guadalupe River Below Comal River	CR	H	PS		80	50	400	5.0	6.5-9.0	200	90
1805	Canyon Lake	CR	E	PS/AP		40	40	400	6.0	6.5-9.0	200	90
1806	Guadalupe River Above Canyon Lake	CR	E	PS		35	30	375	6.0	6.5-9.0	200	90
1807	Coleto Creek	CR	H	PS		250	100	500	5.0	6.5-9.0	200	93
1808	Lower San Marcos River	CR	H	PS		60	50	400	5.0	6.5-9.0	200	90
1809	Lower Blanco River	CR	H	PS		40	50	400	5.0	6.5-9.0	200	92
1810	Plum Creek	CR	H			350	150	1,120	5.0	6.5-9.0	200	90
1811	Comal River	CR	H	PS		25	30	400	5.0	6.5-9.0	200	90
1812	Guadalupe River Below Canyon Dam	CR	E	PS/AP		40	40	400	6.0	6.5-9.0	200	90
1813	Upper Blanco River	CR	E	PS/AP		30	35	400	6.0	6.5-9.0	200	92
1814	Upper San Marcos River *	CR	E			25	25	380	6.0	6.5-9.0	200	80
1815	Cypress Creek	CR	E	PS		20	20	350	6.0	6.5-9.0	200	86
1816	Johnson Creek	CR	E	PS		40	20	350	6.0	6.5-9.0	200	86
1817	North Fork Guadalupe River	CR	E	PS		20	20	350	6.0	6.5-9.0	200	86
1818	South Fork Guadalupe River	CR	E	PS		20	20	350	6.0	6.5-9.0	200	86

* Segment 1814 - Upper San Marcos River is assigned a low-flow criterion of 58 ft³/sec for the application of water quality standards criteria in the same manner as a 7Q2 critical low-flow.

NUECES RIVER BASIN		USES				CRITERIA						
		Recreation	Aquatic Life	Domestic Water Supply	Other	Cl ⁻¹ (mg/L)	SO ₄ ⁻² (mg/L)	TDS (mg/L)	Dissolved Oxygen (mg/L)	pH Range (SU)	Fecal Coliform #/100ml	Temperature (pF)
Segment No.	SEGMENT NAME											
2101	Nueces River Tidal	CR	E						5.0	6.5-9.0	200	95
2102	Nueces River Below Lake Corpus Christi	CR	H	PS		250	250	500	5.0	6.5-9.0	200	91
2103	Lake Corpus Christi	CR	H	PS		250	250	500	5.0	6.5-9.0	200	93
2104	Nueces River Above Frio River	CR	H	PS		700	300	1,500	5.0	6.5-9.0	200	90
2105	Nueces River Above Holland Dam	CR	H	PS		200	200	900	5.0	6.5-9.0	200	90
2106	Nueces/Lower Frio River	CR	H	PS		250	250	500	5.0	6.5-9.0	200	90
2107	Atascosa River	CR	H	PS		600	500	1,500	5.0	6.5-9.0	200	90
2108	San Miguel Creek	CR	H	PS		700	700	2,000	5.0	6.5-9.0	200	95
2109	Leona River	CR	H	PS/AP		650	500	2,000	5.0	6.5-9.0	200	90
2110	Lower Sabinal River	CR	H	PS		200	75	700	5.0	6.5-9.0	200	90
2111	Upper Sabinal River	CR	H	PS/AP		40	75	500	5.0	6.5-9.0	200	90
2112	Upper Nueces River	CR	H	PS/AP		40	40	300	5.0	6.5-9.0	200	90
2113	Upper Frio River	CR	E	PS/AP		25	30	300	6.0	6.5-9.0	200	90
2114	Hondo Creek	CR	H	PS/AP		30	60	300	5.0	6.5-9.0	200	90
2115	Seco Creek	CR	H	PS/AP		30	70	350	5.0	6.5-9.0	200	90
2116	Choke Canyon Reservoir	CR	H	PS		250	250	500	5.0	6.5-9.0	200	90
2117	Frio River Above Choke Canyon Reservoir	CR	H	PS/AP		620	380	1,700	5.0	6.5-9.0	200	90